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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,662	11/20/2003	Tomoyuki Akiyama	031281	7437
23850	7590	10/26/2005	EXAMINER	
ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP 1725 K STREET, NW SUITE 1000 WASHINGTON, DC 20006			DIACOU, ARI M	
			ART UNIT	PAPER NUMBER
			3663	

DATE MAILED: 10/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/716,662	Applicant(s) AKIYAMA, TOMOYUKI	
	Examiner Ari M. Diacou	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5-14-2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the scale and units of measurement on the y axis of the graph in Fig. 4. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 26-27 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. What the applicant means by 1R repeater is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-3, 8-9, 22-23 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hironishi et al. (USP No. 6256137) in view of Kim et al. (USP No. 2001/0043390).

- Regarding claims 1 and 8 Hironishi discloses an optical repeater, comprising:
 - a demultiplexer for dividing an inputted light into a TE wave and a TM wave; [Fig. 4, #1] [Col. 4, lines 54-65]
 - a converter for converting the TM wave into a TE wave; [Fig. 4, #4] [Col. 5, lines 22-34]
 - a multiplexer for coupling a TE wave outputted from said demultiplexer and a TE wave outputted from said converter; [Fig. 4, #3]

but fails to disclose a semiconductor optical amplifier including an active layer that has one type of structure selected from a group composed of a quantum dot, a quantum wire, a quantum dash, and a quantum well. Kim teaches a semiconductor optical amplifier that uses a quantum well in the active medium, and performs amplification to a multiplexed signal [Fig. 2, #30] [¶ 0007].

Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to place a quantum well optical amplifier in the device of Hironishi, for the advantage of increased control of the inversion state.

- Regarding claims 2-3 and 9, Hironishi and Kim disclose the invention with all the limitations of claim 1 above, but in addition Hironishi teaches a multiplexer dividing the light into X and Y modes [Col. 4, lines 54-65]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to use a polarizer to split the polarization multiplexed wave into orthogonal polarized components or TE and TM waves, for the advantage of avoiding some of the complications involved with polarization dependent gain.
- Regarding claims 22-23, all gain equalizers and amplifiers inherently work in a limited range, and if manufactured by man-made processes, work in a limited predetermined range.
- Regarding claims 26-27, as best understood by the examiner, all amplifying repeaters re-amplify the signal, and are therefore 1R repeaters.

8. Claims 6-7, 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hironishi in view of Kim as applied to claim 1 and 8 above, and further in view of Kinoshita et al. (USP No. 6023366). Hironishi and Kim disclose the invention with all the limitations of claim 1, but fail to disclose ALC support structure.

Kinoshita teaches:

- an input detector for detecting an intensity of the inputted light; [Fig. 12, #146] [Col. 13, lines 49-55].
- a variable optical attenuator for attenuating a light outputted from said multiplexer; [Fig. 12, #156]
- an output detector for detecting an intensity of a light outputted from said variable optical attenuator; and [Fig. 12, #162] [Col. 13, lines 7-26]
- an output controller for controlling an intensity of an output signal by controlling operation of said variable optical attenuator based on the intensity detected by said output detector. [Fig. 12, #164] [Col. 13, lines 7-26]

Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to include an optical attenuator based ALC , for the advantage of increased control of the gain spectral profile. Regarding claim 6, Kim discloses

9. Claims 4-5, 10-11, 13-16, 18-21, and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hironishi in view of Kim (and in the case of 12 and 17,

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further in view of Kinoshita) as applied to claims above. Hironishi, Kim and Kinoshita disclose the inventions with all the limitations of claims 1, 8, 12 and 17 above, but in addition Kim teaches the optical repeater wherein said demultiplexer and said multiplexer are monolithically integrated into a PLC with said semiconductor optical amplifier. [Fig. 4] [¶ 0022] Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to monolithically fabricate the multiplexer and demultiplexer, for the advantage of compact manufacture.

10. While patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).

Conclusion

11. The references made herein are done so for the convenience of the applicant. They are in no way intended to be limiting. The prior art should be considered in its entirety.

12. The prior art which is cited but not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ari M. Diacou whose telephone number is (571) 272-5591. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AMD 10/24/2005


JACK KEITH
SUPERVISORY PATENT EXAMINER